

Remarks

Applicant has: (a) cancelled claims 1, 6, 10, 13, 15-16 and 18; and (b) amended claims 3, 8-9, 12, 14, 17 and 19 to place the application in condition for allowance.

The Board of Patent Appeals and Interferences affirmed the Examiner's final rejection in part, and reversed the Examiner's final rejection in part. Specifically, the Board stated:

To summarize, the decision of the examiner to reject claims 1, 3-6, 8-10, 12-20 and 22-24 under 35 U.S.C. § 103 is affirmed as to claims 1, 6, 10, 13, 15, 16 and 18 and reversed as to claims 3-5, 8, 9, 12, 14, 17, 19, 20 and 22-24.

In response, Applicant has: (a) canceled claims 1, 6, 10, 13, 15-16 and 18; and (b) amended claims 3, 8-9, 12, 14, 17 and 19 to put the case in condition for allowance.

In light of the above, Applicant respectfully submits that all the remaining claims are allowable, and Applicant respectfully requests that the Examiner reconsider the case and pass the case to issue. Should the Examiner have any questions or wish to discuss any aspect of the application, a telephone call to the undersigned would be welcome.

Respectfully submitted,

By: _____

Michael B. Einschlag
Reg. No. 29,301
(650) 949-2267
25680 Fernhill Drive
Los Altos Hills, Calif. 94024

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Cancel Claim 1.

Claim 3 has been amended as follows:

3. (Amended) A heat exchange panel to be conformed to a complex shape, comprising:

a first layer of a flexible material, which layer is conformable to a complex shape;
a second layer of a flexible material, which layer also is conformable to a complex shape and has a common border with the first layer;

a border seal sealing the first layer and the second layer at said border; and
said first and second layers being directly secured together interiorly of said border at a multiplicity of points to form a dot matrix of attachments organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to about 100°;

[The panel of claim 1,] wherein:

the border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

4. (Not Amended) The panel of claim 3, further comprising:

a first port for passing fluid into the panel;

a second port for passing said fluid out of the panel; and

at least one fence interiorly of said border sealing the first layer and the second layer, said fence cooperating with said border to define a fluid flow channel within said panel.

5. (Not Amended) The panel of claim 4, wherein:

the fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the fence.

Cancel claim 6.

Claim 8 has been amended as follows:

8. (Amended) A method of manufacturing a heat exchange panel which conforms to a complex shape comprising steps of:

sealing a first layer of a flexible material, which layer is conformable to a complex shape to a second layer of a flexible material at a common border, which second layer is also conformable to a complex shape; and

sealing said first layer to said second layer interiorly of said border at a multiplicity of points to form a dot matrix of attachments, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to about 100°;

[The method of claim 6,] wherein:

the first step of sealing includes sealing said first layer to said second layer with a border seal having curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

Claim 9 has been amended as follows:

9. (Amended) A method of manufacturing a heat exchange panel which conforms to a complex shape comprising steps of:

sealing a first layer of a flexible material, which layer is conformable to a complex shape to a second layer of a flexible material at a common border, which second layer is also conformable to a complex shape; and

sealing said first layer to said second layer interiorly of said border at a multiplicity of points to form a dot matrix of attachments, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to about 100°;

[The method of claim 6,] further comprising steps of:

constructing first and second ports for passing a fluid into and out of said panel; and

sealing said first layer to said second layer with at least one fence between said first port and said second port, said fence having curvilinear ripples having ripple cycle lengths substantially shorter than the length of said fence.

Cancel Claim 10.

Claim 12 has been amended as follows:

12. (Amended) A method for exchanging heat with a complex shape, comprising steps of:

receiving a fluid flow in a first port;

restricting passage of said fluid flow to between first and second layers of flexible material which are conformable to a complex shape;

further restricting said passage with a border seal at a common border between said first and said second layers;

passing said fluid flow about a multiplicity of points interiorly of said first and second layers, said first and second layers being directly secured together to form a dot matrix of attachments organized into first imaginary lines and second imaginary lines connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to about 100°; and

issuing said fluid flow through a second port;

[The method of claim 10,] wherein:

said border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

Cancel Claim 13.

Claim 14 has been amended as follows:

14. (Amended) A method for exchanging heat with a complex shape, comprising steps of:

receiving a fluid flow in a first port;

restricting passage of said fluid flow to between first and second layers of flexible material which are conformable to a complex shape;

further restricting said passage with a border seal at a common border between said first and said second layers;

passing said fluid flow about a multiplicity of points interiorly of said first and second layers, said first and second layers being directly secured together to form a dot matrix of

attachments organized into first imaginary lines and second imaginary lines connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to about 100°; and

issuing said fluid flow through a second port;

further restricting said fluid flow with at least one fence between said first port and said second port;

[The method of claim 13,] wherein:

 said fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of the sealing fence.

Cancel Claims 15 and 16.

Claim 17 has been amended as follows:

17. (Amended) A system for exchanging heat with a complex shape; comprising:

a heat transfer device for one of cooling or heating a fluid;

a pump/reservoir coupled to the heat transfer device for storing and pumping said fluid; and

a heat exchange panel coupled to the pump/reservoir and the heat transfer device, the heat exchange panel including a first layer of a flexible material conformable to a complex shape, a second layer of a flexible material also conformable to a complex shape, a border seal sealing said first layer and said second layer together at said border, a first port for receiving said fluid, a second port contiguous with said first port for issuing said fluid, and said first and second layers being directly secured together interiorly of said border seal to form a dot matrix of attachments between said first and second layers, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to about 100°;

wherein: one of (i) said first lines and (ii) said second lines has an angle in a range of about 25° to about 65° with respect to a nominal direction of a flow of said fluid; and

[The system of claim 15,] wherein:

said border seal includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said border.

Cancel Claim 18.

Claim 19 has been amended as follows:

19. (Amended) A system for exchanging heat with a complex shape; comprising:

a heat transfer device for one of cooling or heating a fluid;

a pump/reservoir coupled to the heat transfer device for storing and pumping said fluid; and

a heat exchange panel coupled to the pump/reservoir and the heat transfer device, the heat exchange panel including a first layer of a flexible material conformable to a complex shape, a second layer of a flexible material also conformable to a complex shape, a border seal sealing said first layer and said second layer together at said border, a first port for receiving said fluid, a second port contiguous with said first port for issuing said fluid, and said first and second layers being directly secured together interiorly of said border seal to form a dot matrix of attachments between said first and second layers, said dot matrix organized into first imaginary lines and second imaginary lines for connecting dots of said dot matrix to nearest dots of said dot matrix, said first imaginary lines crossing said second imaginary lines at an angle falling in a range of between about 70° to about 100°;

wherein: the heat exchange panel further includes at least one fence interiorly of the border sealing said first layer and said second layer, said fence cooperating with said border to define a fluid flow channel within said panel; and

[The panel of claim 18,] wherein:

said fence includes curvilinear ripples having ripple cycle lengths substantially shorter than the length of said fence.

20. (Not Amended) The panel of claim 4 wherein said first and second ports are contiguous.

22. (Not Amended) A heat exchange panel to be conformed to a complex shape, comprising:

a first layer of a flexible material, which layer is conformable to a complex shape;
a second layer of a flexible material, which layer also is conformable to a
complex shape;

a border seal sealing the first layer and the second layer to form a border, the
border seal including curvilinear ripples having ripple cycle lengths substantially shorter than the
length of said border.

23. (Not Amended) The heat exchange panel of claim 22 further
including at least one fence interiorly of said border, which fence is sealed to the first layer and
the second layer and includes curvilinear ripples having ripple cycle lengths substantially shorter
than the length of the fence.

24. (Not Amended) The heat exchange panel of claim 23 further
including a first port for passing fluid into the panel and a second port for passing said fluid out
of the panel, said first and second ports being contiguous.

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